

Recovery Plan Action Status

Plan Name: Recovery Plan for the Ka`u Silversword (*Argyroxiphium kauense*)

Plan Status: Final

Plan Date: 21-Nov-95

Lead Agency: USFWS

Lead Office: Pacific Islands Fish And Wildlife Office

(408)

(792-9400)

Species	Action Priority #	Action #	Action Description	Action Status	Est. Initiation Date	Est. Completion Date	Responsible Parties	Work Type	Labor Type	Action Comments
Mauna Loa (=Ka'u) silversword (<i>Argyroxiphium kauense</i>)	1	111	Secure habitat on Kahuku Ranch	Complete	Prior to FY 1995	FY 2000 - FY 2004	Damon Estate, Hawaii Volcanoes National Park	Acquisition: Fee Title	Internal Technical Assistance	The land was purchased from Damon Estate by the National Park Service and added to Hawaii Volcanoes National Park in 2004. While ES was originally identified as the lead for this task, it has been taken over the the National Park Service.
Mauna Loa (=Ka'u) silversword (<i>Argyroxiphium kauense</i>)	1	112	Secure habitat in Waiakea and Kapapala Forest Reserves	Partially Complete	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Acquisition: Management Agreement	Internal Technical Assistance	Small areas within Waiakea and Kapapala (<10 ac) have been fenced and are managed for the Mauna Loa silversword, but larger landscape areas will be needed for full recovery. All are under the jurisdiction of the Hawaii Division of Forestry and Wildlife, which is therefore the lead agency, even though ES was orginally designated as the lead.

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Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	1	113	Secure habitat in Volcano National Park	Complete	Prior to FY 1995	Prior to FY 1995	U.S. Fish and Wildlife Service, Ecological Services Division, Hawaii Volcanoes National Park	Acquisition	Internal Technical Assistance	The National Park Service has agreed to long-term protection of Hawaii Volcanoes National Park lands in the Mauna Loa Strip area for Mauna Loa silversword recovery efforts. National Park Service is the lead for this task, even though ES was originally designated as lead.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	1	12111	Enhance and maintain fencing at Keapohina	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, Damon Estate, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Management: Predator and Competitor Control	Internal Technical Assistance	The National Park Service has repaired the fence around the original wild population and increased the fenced area by approximately 20 acres, as well as 2 other 20-30 acres sites nearby for additional reintroductions.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	1	12112	Enhance and maintain Waiakea fencing	Complete	FY 1995 - FY 1999	FY 2008	U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Management: Predator and Competitor Control	Internal Technical Assistance	The entire bog complex at Waiakea containing Mauna Loa silverswords has been fenced to exclude pigs and is being maintained by Hawaii Division of Forestry and Wildlife.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	1	1212	Eradicate feral ungulates in areas around exclosures	Partially Complete	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, Damon Estate, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Management: Predator and Competitor Control	Internal Technical Assistance	Hawaii Volcanoes National Park has removed animals from a larger fenced area around the reintroduced population in the Mauna Loa Strip area. The removal of ungulates in a larger area around existing wild populations has not started at Keapohina or on State lands.

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Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	1	122	Identify other extant populations and manage threats	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Research: Population Surveys	Species Expert	Hawaiian Silversword Foundation, Hawaii Volcanoes National Park, and Hawaii Division of Forestry and Wildlife are continually searching for additional populations within suitable habitat. The Kapapala population on State land was rediscovered in 1996 and has since been monitored annually.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	1231	Post warning signs on fences	Obsolete	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, Damon Estate, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Management: Other	Internal Technical Assistance	The Waiakea population has a sign posted, since it is easily accessible to the public and within a State hunting unit. The areas within Hawaii Volcanoes National Park do not require posted signs, as the park has many signs throughout discouraging damage to native vegetation and geological features. The value of warning signs has been brought into question in Hawaii, as other posted populations have encouraged rather than discouraged vandalism.

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Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	3	1232	Prepare and distribute education materials	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Other: Information and Education	Internal Administrative	Several articles on the silversword reintroduction have appeared in the Endangered Species Bulletin and popular magazines. Volunteers from the correctional facility, local schools, and the local community are recruited for reintroduction efforts, and so learn about the recovery efforts. Additional efforts to reach the general public are still needed, as well as scientific articles to share the reasons for success of what is probably the largest single species reintroduction effort in the country.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	1	1241	Map and monitor Waiakea individuals	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Research: Population Surveys	Species Expert	The population is monitored annually by the Hawaiian Silversword Foundation and/or Hawaii Division of Forestry and Wildlife. Detailed counts of all size and age classes are not conducted, however, because the bog habitat is extremely fragile and it is difficult to see young plants within the bog, making the trampling impacts from monitoring too risky.

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Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	1	1242	Map and monitor Keapohina individuals	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, Damon Estate, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Research: Population Surveys	Species Expert	The Hawaiian Silversword Foundation and the National Park Service monitor this population at least annually.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	1	1243	Map and monitor newly established individuals	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Research: Population Surveys	Species Expert	The Kapapala, Waiakea, and Keapohina wild populations, and the reintroductions at these three sites as well as in the Mauna Loa Strip area of Hawaii Volcanoes National Park and Kulani, Kipuka Ainahou, Waiakea Forest Reserve, and Hilo Forest Reserve on State lands are monitored annually.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	1	125	Determine effect of alien plants on the Ka'u silversword	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources, Hawaii Volcanoes National Park	Research: Competition	Internal Technical Assistance	Currently, alien plant species do not appear to be a threat to the Mauna Loa silversword except for the bog population at Waiakea and outplanted populations in other bogs. At these sites, Axonopus fissifolius and Carex sp. are being controlled. Alien plant threats at the other sites are assessed when silversword populations are monitored, and if any appear to be threats, additional research and/or management actions will be taken.

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Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	21	Determine the environmental factors affecting habitat preference	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources, U.S. Geological Survey, Biological Resources Division	Research: Habitat Requirements	Internal Technical Assistance	This is an ongoing effort, constantly refined as more is learned about the success or failure of various reintroduction efforts and the survivorship of wild individuals.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	22	Assess the factors limiting germination and establishment	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources, U.S. Geological Survey, Biological Resources Division	Research: Habitat Requirements	Internal Technical Assistance	This is an ongoing effort, constantly refined as more is learned about the success or failure of various propagation methods and reintroduction efforts.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	23	Assess the factors influencing reproductive biology	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources, U.S. Geological Survey, Biological Resources Division	Research: Habitat Requirements	Contract, Graduate Student, Internal Technical Assistance, Species Expert	This is an ongoing effort, constantly refined as more is learned about the success or failure of propagation efforts, various reintroduction efforts, and population monitoring.

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Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	24	Develop and implement genetic management techniques as needed	Complete	FY 1995 - FY 1999	FY 1995 - FY 1999	U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources, U.S. Geological Survey, Biological Resources Division	Management: Propagation	Contract	The genetics of the Mauna Loa silversword have been studied using microsatellite markers by a population geneticist at Rancho Santa Ana Botanical Garden and the three wild populations, which occur in very different habitats, are genetically distinct. This information has been incorporated into the reintroduction efforts for this species by maintaining the genetic distinctness of the different habitat preferences.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	25	Research/monitor insect and disease damage	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources, U.S. Geological Survey, Biological Resources Division	Research: Population Surveys	Internal Field Assistance	The Hawaiian Silversword Foundation, Hawaii Volcanoes National Park, and Hawaii Division of Forestry and Wildlife continually monitor for insect and disease damage. In 2003, propagated individuals were infested with fungus, and so were destroyed rather than reintroduced. A native tephritid insect eats the seeds, but does not appear to reduce the seed supply significantly. All sites are monitored for ants, which prey on the solitary bees that pollinate the silversword.

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Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	26	Determine causes of pre-flowering mortality	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources, U.S. Geological Survey, Biological Resources Division	Management: Predator and Competitor Control	Contract	The populations are continually monitored for mortality. Many plants in unfenced areas remain in the juvenile size class for years or even decades before dying without flowering. The causes are most likely predation by feral ungulates and/or establishment in poor quality sites with not enough soil for full growth and reproduction. While no detailed experimental research is occurring, monitoring of wild and outplanted populations provides a great deal of information that enhances future reintroduction efforts.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	27	Develop methods to reduce other threats, as necessary	Not Started			U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources, U.S. Geological Survey, Biological Resources Division	Management: Other, Research: Management Techniques	Contract, Internal Field Assistance, Species Expert	This has not been needed to date.

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Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	311	Choose sites in the Upper Waiakea Forest Reserve	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Research: Habitat Requirements	Internal Field Assistance	The Hawaiian Silversword Foundation and Hawaii Division of Forestry and Wildlife are working together to select reintroduction sites in the Waiakea Forest Reserve. Several sites have been selected and have already received reintroduction materials, and surveys are ongoing for additional sites in the area.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	312	Choose sites on Kahuku Ranch and in Kapapala Forest Reserve	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Acquisition: Management Agreement	Internal Field Assistance	The Hawaiian Silversword Foundation and Hawaii Division of Forestry and Wildlife have selected one site in Kapapala and are conducting reintroduction there, and are surveying for additional sites. The Hawaiian Silversword Foundation and Hawaii Volcanoes National Park are currently expanding fencing in Kahuku for additional reintroduction efforts there.

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Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	313	Consider sites in other areas of the historical range	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Acquisition: Management Agreement	Internal Field Assistance	The Hawaiian Silversword Foundation and Hawaii Division of Forestry and Wildlife are also reintroducing plants at sites in Hilo Forest Reserve and Kipuka Ainahou. The Hawaiian Silversword Foundation and Olaa-Kilauea Management Group are reintroducing plants into Kulani Correctional Facility and Keauhou Ranch. The Hawaiian Silversword Foundation and Hawaii Volcanoes National Park are reintroducing plants into the Mauna Loa Strip area of the park.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	32	Protect the new sites	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Damon Estate, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Acquisition: Management Agreement	Contract	All of the reintroduction sites are on Federal or State lands and are managed for endangered species. Federal lands are managed by the National Park Service and State lands by HIDFor, so DE should be removed as responsible party.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	331	Construct and maintain fencing at new sites	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Damon Estate, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Management: Predator and Competitor Control	Internal Field Assistance	All of the reintroduction sites are fenced or in the process of being fenced to exclude feral pigs and mouflon sheep. In Kulani, Upper Waiakea Forest Reserve, and Kipuka Ainahou invasive alien plant species are being controlled.

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Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	332	Reduce ungulate populations through hunting	Partially Complete	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Damon Estate, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Management: Predator and Competitor Control	Internal Field Assistance	Hawaii Volcanoes National Park has removed animals from a larger fenced area around the reintroduced population in the Mauna Loa Strip area. The removal of ungulates in a larger area around existing wild populations has not started at Keapohina or on State lands.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	341	Implement cross-pollination for plants that will flower	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Management: Propagation	Internal Field Assistance	Cross-pollination is conducted within each population, but not between populations (see #24). In addition, material is grown in the Volcano Rare Plant Facility from wild collected seeds or cuttings to use as a managed breeding population, allowing the production of more seed. Only 1st generation seedlings are used for reintroductions.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	342	Collect ripe seed from fruiting plants in each population	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Management: Propagation	Internal Field Assistance	Seed from wild and controlled breeding stock are collected every year, from both cross-pollinated and naturally pollinated flowers.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	343	Develop methods for seed storage	Partially Complete	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Research: Propagation	Internal Field Assistance	Short-term (1-3 years) storage is possible with moderate humidity in refrigeration. Tests for long-term storage still need to be conducted.

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Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	3441	Choose microsites to be seeded	Planned	FY 2006		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Research: Habitat Requirements	Internal Field Assistance	U.S.G.S. Biological Resources Division has submitted a proposal to conduct broadcast seeding experiments. If the proposal is funded, this work should begin FY 2006.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	3442	Seed protected sites	Planned	FY 2006		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Research: Habitat Requirements	Internal Field Assistance	U.S.G.S. Biological Resources Division has submitted a proposal to conduct broadcast seeding experiments. If the proposal is funded, this work should begin FY 2006.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	3443	Monitor seeded sites and record success	Planned	FY 2006		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Research: Habitat Requirements	Internal Field Assistance	U.S.G.S. Biological Resources Division has submitted a proposal to conduct broadcast seeding experiments. If the proposal is funded, this work should begin FY 2006.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	345	Review seeding success and change methods as necessary	Planned	FY 2007		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Research: Habitat Requirements	Internal Field Assistance	U.S.G.S. Biological Resources Division has submitted a proposal to conduct broadcast seeding experiments. If the proposal is funded, this work should begin FY 2006.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	351	Determine best methods for greenhouse propagation	Complete	FY 1995 - FY 1999	FY 1995 - FY 1999	Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources, U.S. Geological Survey, Biological Resources Division	Research: Propagation	Internal Field Assistance	Volcano Rare Plant Facility has been propagating reintroduction material by the 1000's every year since 1999.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	352	Propagate plants for re-establishment	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Management: Propagation	Internal Field Assistance	Volcano Rare Plant Facility has been propagating reintroduction material by the 1000's every year since 1999.

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Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	3531	Choose microsites for outplanting	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Management: Reintroduction	Internal Field Assistance	The method of selecting reintroduction microsites is constantly being refined, but is relatively successful, with at least 80% survivorship to date. One exception is one reintroductions into Kulani pocket bogs, which flooded and killed many of the outplants. Plants are now put into microsites further away from the edge of the pocket bogs. The only other exception is the use of Waiakea source material for reintroduction into a more dry habitat on Mauna Loa Strip in Hawaii Volcanoes National Park. The plants did not grow well, and were subsequently destroyed when one mouflon sheep got into the fenced area. Since then, Kapapala source material was found and has been used at this reintroduction site with much greater success.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	3532	Outplant seedlings	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Management: Reintroduction	Internal Field Assistance	See #3531.

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Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	3533	Monitor outplanted sites and record success	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Management: Reintroduction	Internal Field Assistance	See 3531. As of 10/06/2005 6,525 seedlings have been reintroduced from 22 Waiakea founders and survivorship is ca 40%; 13,729 seedlings have been reintroduced from 96 Kapapala founders and survivorship is ca 80%; 387 seedlings have been reintroduced from 19 Kahuku founders with ca 99% survivorship, and seed was collected in September 2005 from an additional 34 founders from Kahuku stock.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	354	Review outplanting success and change methods, as necessary	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Management: Reintroduction	Internal Field Assistance	See #3531, 3532, 3533.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	4111	Determine need to enhance current populations	Complete	FY 1995 - FY 1999	FY 1995 - FY 1999	U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Research: Demographic Studies	Internal Field Assistance	Because all of the wild populations are relatively small, the species is long-lived and monocarpic (only flowers once), and only a small porportion of the population flowers in any given year, each of the populations is being augmented.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	4112	Identify specific areas to expand	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Research: Habitat Requirements	Internal Field Assistance	See #4111.

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Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	412	Spread seed	Not Started			U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Research: Reintroduction	Internal Field Assistance	See #343 through #345.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	413	Transplant seedlings if necessary	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Management: Reintroduction	Internal Field Assistance	See #351 through 354.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	414	Monitor success of seeding and transplanting	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Research: Reintroduction	Internal Field Assistance	See #3533.
Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	2	415	Maintain records of all enhancement activities	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Research: Reintroduction	Species Expert	The Hawaiian Silversword Foundation is the central database for all data related to the Mauna Loa silversword reintroduction. Data is collected by the Hawaiian Silversword Foundation, Hawaii Volcanoes National Park, Hawaii Division of Forestry and Wildlife, and Volcano Rare Plant Facility.

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Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	3	51	Estimate # of plants & populations needed for long term survival	Ongoing Current	FY 2000 - FY 2004		U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources, U.S. Geological Survey, Biological Resources Division	Management: Planning	Internal Administrative	The true success of this large reintroduction effort will not be known until planted individuals flower and produce viable seeds that become established naturally. In the meantime, the results of current efforts lead the species experts to believe that downlisting will be possible when 10 populations (sustainable recovery for each source population, since in very different habitats and the three sources populations are genetically divergent based on micro-satellite data), with 2,500-3,000 reproductive-sized individuals in each population (self-incompatible, monocarpic, and long-lived) are sustained over 25 years (second generation recruitment in reintroduced plants expected); and management maintained in perpetuity or until no longer necessary.

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Mauna Loa (=Ka'u) silversword (Argyroxiphium kauense)	3	52	Revise recovery objectives	Not Started			U.S. Fish and Wildlife Service, Ecological Services Division, Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources	Other: Administration	Internal Administrative	The revision of recovery objectives will be considered when planted individuals begin producing viable seeds and natural seedling establishment occurs. At that point, the likelihood of success of the reintroduction effort will be better understood, and numbers of individuals needed can be adjusted based on reproductive success.